STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

SMARTY JONES THINNING & CC

ROAD PLAN

SECTION 23, 24, TOWNSHIP 12 NORTH, RANGE 03 WEST, W.M.
LEWIS COUNTY

LEWIS DISTRICT

AGREEMENT NO.: 30-078640 LEAD FORESTER: Seth Barnes

DATE: 12/01/05 STAFF ENGINEER: Randy Kirk

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes, but is not limited to construction and optional construction including:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition and application of rock;
grass seeding.

This project also includes but is not limited to reconstruction and optional reconstruction including:

clearing between right-of-way tags;
widening road segments;
reconstructing excavation slopes;
grubbing between the limits shown on the Typical Section Sheet;
right-of-way debris disposal;
landing construction;
cleaning ditches and existing culverts;
reconstructing ditches;
acquisition and installation of additional drainage structures;
grading and shaping existing road surface and turnouts;
compaction of road surface;
acquisition and application of rock;
grass seeding.

This project also includes but is not limited to pre-haul maintenance including:

Road	Mile Posts	Requirements
J-3300	0.0 to 1.8	Grade running surface, spot patch, clean ditches and existing culverts, install new culverts and ditchouts.
J-4000	0.0 to 0.41	Grade running surface, clean ditches and existing culverts, apply optional lift of rock.
J-6000	0.0 to 0.7	Grade running surface.
J-6100	0.0 to 1.65	Grade running surface, spot patch, hand clean flumes.

SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction, reconstruction, pre-haul maintenance, or abandonment including landings unless otherwise noted.

1.1-2

Construction, reconstruction, or pre-haul maintenance of the following roads is required. All roads shall be constructed, reconstructed or pre-haul maintained on the State's location and in accordance with this Road Plan.

Road	Stations	Type
J-3300	MP 0.00 to MP 2.00	Pre-haul maintenance
J-3320	0+00 to 3+42	Reconstruction
J-3321	0+00 to 7+28	Construction
J-4000	MP 0.0 to MP 0.41	Pre-haul maintenance
J-6000	MP 0.0 to MP 0.7	Pre-haul maintenance
J-6100	MP 0.0 to MP 1.65	Pre-haul maintenance

1.1-3

Construction or reconstruction of the following roads is not required. Roads used by the Purchaser shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
J-3310	0+00 to 0+88	Construction
	0+88 to 10+30	Reconstruction
	10+30 to 10+61	Construction
J-3320	3+42 to 8+75	Reconstruction
	8+75 to 14+27	Construction
J-3330	0+00 to 13+38	Reconstruction
J-3340	0+00 to 3+49	Construction
J-3350	0+00 to 12+43	Construction
J-3360	0+00 to 2+55	Construction
J-3370	0+00 to 5+66	Construction
J-4000	0+00 to 16+24	Reconstruction
J-4001	0+00 to 3+33	Construction

1.1-4

If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-7

Hauling of forest products or equipment may require a county road hauling permit. Purchaser is responsible for obtaining a permit, and any costs associated with extra maintenance or repair levied by a county.

1.2-1

The construction, reconstruction, abandonment, or pre-haul maintenance of any roads specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed, reconstructed, or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application and/or timber haul.

1.3-2

All roads are intended for dry weather use. Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.

1.4-3

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

1.5-3

Snowplowing shall not be permitted unless authorized, in writing, by the Contract Administrator.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

2.1-3

Right-of-way timber shall not be decked within the grubbing limits or in locations that interfere with the construction of the road prism or impede drainage.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

3-5

Organic material shall be excluded from the road subgrade width as shown in TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-1

Right-of-way debris shall be scattered outside the grubbing limits.

4.2.3-2

Right-of-way debris shall not be placed against standing timber.

SECTION 5 - EXCAVATION

5.1-1

Roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-2

Purchaser shall not bury merchantable material.

5.1-3

Road grade and alignment shall conform to the State's marked location. The reconstruction of existing road grades shall conform to the original location except where controlled by slope stakes. Grade and alignment shall have smooth continuity, without abrupt changes in direction.

Construction limitations are as follows:

Favorable Grade	Adverse Road Grade	Minimum Curve Radius
18%	14%	60 feet

Changes in road grade shall not exceed 6% within 100 feet. Adverse grades on curves shall not exceed 10% of the curve radius. Favorable grades through switchbacks shall not exceed 12%. Transition grades entering and leaving switchbacks shall not exceed a 5% grade change.

A switchback is defined as a curved segment of road between a beginning and end of the same curve, where the change of traffic travel direction is greater than 90 degrees.

Transition grades required to meet switchback grade limitations shall be constructed on the tangents preceding and departing from the switchbacks.

5.1-4

Minimum extra widening on the inside of curves shall be:

2 feet extra	80 to 100 foot radius curve
4 feet extra	60 to 80 foot radius curve

5.1-5

Curve widening, where required, shall be added to the inside of curves.

5.1-7

Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Embankments shall be widened as follows:

Height at Centerline	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment Slope Ratio
Common Earth and Rounded Gravel	1½:1
Angular Rock	1¼:1
Sandy Soils	2:1

5.1-14

Where side slopes exceed 45 percent, full bench construction shall be utilized for the entire subgrade width.

5.1.1-6

On the following road, full bench reconstruction shall be utilized with all excess excavated material end hauled or pushed to designated waste areas.

End Haul/Waste Material Disposal

Road	Stations	Waste Area Location
J-3310	0+88 to 10+30	0+00 or 10+61

5.1.1-8

The amount of material to be contained in a waste area shall be at the discretion of the Contract Administrator.

5.1-17

Turnouts shall be constructed and shall be intervisible with a maximum of 1,000 feet between turnouts unless shown otherwise on drawings. Location shall be subject to written approval of the Contract Administrator.

5.1-18

Turnarounds shall be no larger than 30 feet long and 30 feet wide. Location shall be subject to written approval of the Contract Administrator.

5.1-20

On the following roads, Purchaser shall construct ditches and reconstruct excavation slopes to provide sufficient width for ditches and road surface. Excavated slopes shall be consistent with Clause 5.1-8. Excavated material shall be scattered outside the grubbing limits or end hauled to designated waste areas consistent with Clause 5.1.1-6. Pulling ditch material across the road or mixing in with the existing road surface will not be allowed.

Road	Stations
J-3310	0+88 to 10+30
J-3320	0+00 to 3+42

5.1.1-1

Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-3

Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.1.1-5

When constructing landings, waste material and embankment shall not be placed on side slopes steeper than 45%.

5.2-1

Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.

5.3-1

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 12 inch or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.4-1

Silt-bearing runoff shall not be permitted to go into streams.

5.4-2

Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3.1

On the following roads, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

Mixture Percent by Weight	Minimum Percent Germination
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:

1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Required seed not spread by the termination of this contract shall become property of the State.

Road	Stations	Seed Quantity (lbs)
J-3310	0+00 to 10+61	45
J-3320	0+00 to 14+27	60
J-3321	0+00 to 7+28	30
J-3330	0+00 to 13+38	60
J-3340	0+00 to 3+49	15
J-3350	0+00 to 12+43	55
J-3360	0+00 to 2+55	10
J-3370	0+00 to 5+66	20
J-4000	0+00 to 16+24	65
J-4001	0+00 to 3+33	15

5.5-5

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

5.5-6

On all roads being pre-haul maintained or reconstructed, a grader shall be used to shape the existing surface.

SECTION 6 - DRAINAGE

6.2.1-1

On required construction, reconstruction or pre-haul maintenance, Purchaser shall furnish, install, and maintain galvanized culverts meeting AASHTO Specification No. M-36 or corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) and on culverts over 24 inches, aluminized culverts (meeting ASTM A 819, AASHTO M-274 aluminized steel Type 2 and AASHTO M-36 specifications) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-1.1

On optional construction or reconstruction, Purchaser shall install and maintain culverts of the length and diameter specified on the CULVERT LIST. Culverts may be new or used steel or plastic. All used culverts are subject to written approval by the Contract Administrator prior to installation.

6.2.1-2

On required construction, reconstruction or pre-haul maintenance annular corrugated bands and culvert ends shall be used on metal culverts. Manufacturer's approved hinged split coupler bands shall be used on corrugated polyethylene pipe, bands shall have a minimum of 4 corrugations, 2 on each side of the pipe joint.

6.2.1-6

Metal, concrete, or plastic culverts and bands removed from the road bed shall be removed from State land prior to termination of this contract.

6.2.2.1-1

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.2.2.5-2

Downspouts and flumes shall be staked on both sides at maximum intervals of 10 feet with 6 foot heavy duty steel posts, and fastened securely to the posts with No. 10 galvanized smooth wire in accordance with CULVERT AND DRAINAGE SPECIFICATIONS DETAIL.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.3-2

On all reconstructed roads, cleaning or reconstructing the ditchline, culvert headwalls, and catch basins and outlets shall be completed prior to application of rock or timber haul and shall be done in accordance with the TYPICAL SECTION SHEET and Standard Details.

On the following pre-haul maintained roads, cleaning or reconstructing the ditchline, culvert headwalls, and catch basins and outlets shall be completed prior to application of rock or timber haul and shall be done in accordance with the TYPICAL SECTION SHEET and Standard Details.

ROAD	MILE POSTS
J-3300	MP 0.00 to 2.00
J-4000	MP 0.00 to 0.41

6.4-1

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL.

6.5-2

Embankment slopes adjacent to new culvert inlets and outlets shall be armored with machine placed light loose riprap for a distance of one culvert diameter on each side of the pipe and one culvert diameter above the pipe.

SECTION 7 - ROCK

7.1-6

Rock for reconstruction and pre-haul maintenance under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

Possible Source	Location
Good's Quarry	699 Tennessee Rd. Winlock, WA
Brown Rd. Quarry	1029 Brown Rd. Chehalis, WA

7.2.1-4

Rock shall meet the following specifications for gradation and quality. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator.

7.2.1.1-5

2½ INCH MINUS CRUSHED ROCK

% passing 2½" square sieve	100%
% passing 2" square sieve	65 -100%
% passing 1" square sieve	50 - 70%
% passing ¼" square sieve	30 - 50%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-7

4 INCH MINUS ROCK

% equal to, or smaller in one dimension than the specified size	100%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.2-2

Pit run rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash. Pit run rock will meet the following specifications for rock gradation when placed on the subgrade: No more than 10% of the rock shall be larger than 8 inches in any dimension and no rock shall be larger than 12 inches in any dimension.

7.2.1.1-10

8 INCH PLUS ROCK

% equal to, or larger in one dimension than the specified size	100%

All percentages are by weight.

7.2.3-1

Measurement of the rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.4.2-1

Apply at least the minimum required rock quantity as shown on the ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-4

On the following roads, if hauling shall take place only from June 1 to September 30, Purchaser may not be required to place or provide the optional rock in the ROCK LIST. Purchaser shall then be required to submit a written plan for approval by the Contract Administrator describing how these roads shall be constructed, used, and abandoned in compliance with all other clauses in the ROAD PLAN.

ROAD	STATIONS
J-3310	0+00 to 10+61
J-3320	0+00 to 14+27
J-3321	0+00 to 7+28
J-3330	0+00 to 13+38
J-3340	0+00 to 3+49
J-3350	0+00 to 12+43
J-3360	0+00 to 2+55
J-3370	0+00 to 5+66
J-4000	MP 0.2 to MP 0.41
J-4000	0+00 to 16+24
J-4001	0+00 to 3+33

7.4.2-6

A grader shall be used to shape the subgrade and existing surface prior to the application of rock or timber haul.

7.4.2-9

Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-3

Rock shall be spread and compacted using loaded haul trucks concurrently with rock hauling operations.

7.4.4-1

Riprap shall consist of angular stone placed on as indicated in this plan.

Loose Riprap - The stone for loose riprap shall be hard, sound and durable. It shall be free from segregation, seams, cracks, and other defects tending to destroy its resistance to weather. Loose riprap shall be free of rock fines, soil, or other extraneous material.

Light Loose Riprap - Shall meet the following requirements for grading:

At Least/Not More Than	Size Range	Maximum Size
20% / 90%	300 lbs. to 1 ton	--
80% / --	50 lbs. to 1 ton	--
10% / 20%	--	50 lbs.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.1-1

The following roads shall be deactivated by the Purchaser at the termination of use and according to the ROAD ABANDONMENT CROSS SECTIONS DETAIL

J-3310	0+00 to 10+61	Light
J-3320	3+42 to 14+27	Light
J-3330	0+00 to 13+38	Light
J-3340	0+00 to 3+49	Light
J-3350	0+00 to 12+43	Light
J-3360	0+00 to 2+55	Light
J-3370	0+00 to 5+66	Light
J-4000	0+00 to 16+24	Light
J-4001	0+00 to 3+33	Light

9.1-2

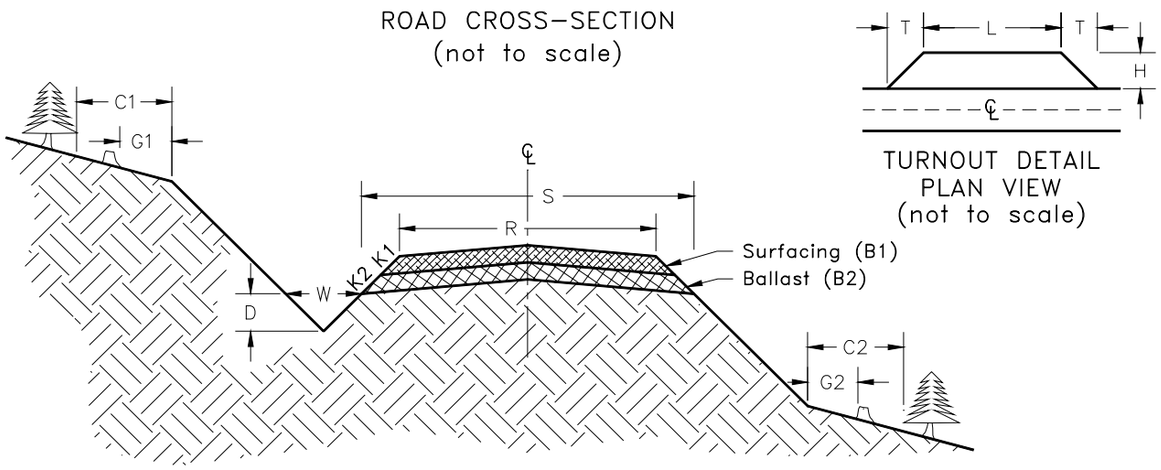
Light Deactivation shall consist of:

constructing non-drivable water bars in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet; or as marked in the field;
skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
keying water bars into ditchline;
construction of tank trap barriers in conformance with the attached "T" TANK TRAP DETAIL;
removing all culverts and leaving the resulting trench open;
sloping all trench walls and approach embankments no steeper than 2:1;
removing all excavated culverts from State land;
grass seeding concurrently with deactivation and in accordance with Clause: 5.4-3.1;
covering, concurrently with deactivation, all exposed soils within 100 feet of any live stream, with a 8 inch deep layer of straw.

9.1-7

Purchaser shall remove existing culverts from live streams and leave the resulting trench open with excavation slopes and trench bottom as specified. The trench bottom shall conform to natural stream profile. Excavated material shall be placed in the waste area approved in writing by the Contract Administrator. Culvert removal from live streams shall be in accordance with the FILL REMOVAL DETAIL, SETTLING POND AND PUMP DETAIL, and the LIVE STREAM CULVERT REMOVAL PROCEDURE.

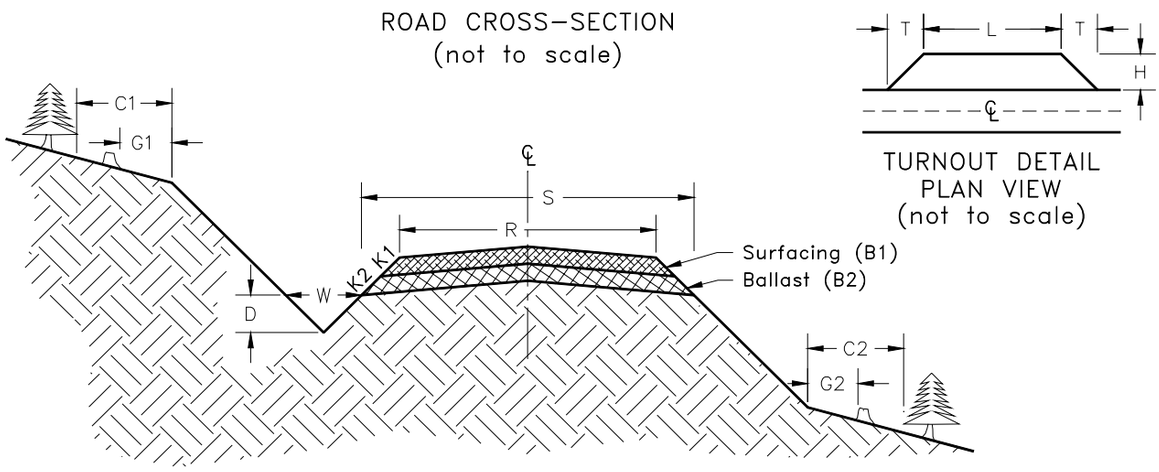
TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch Width	Ditch Depth	Crown in. @ CL	Grubbing Limits		Clearing Limits	
				S	R	W	D		G1	G2	C1	C2
J-3300	MP 0.00	MP 0.20	-	-	12’	-	-	4”	-	-	-	-
J-3310	0+00	0+88	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
	0+88	10+30	C	15’	12’	2’	1’	4”	2’	EOS	R/W	R/W
	10+30	10+61	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-3320	0+00	3+42	C	18’	12’	3’	1’	4”	2’	2’	R/W	R/W
	3+42	8+75	C	15’	12’	2’	1’	4”	BOD	EOS	R/W	R/W
	8+75	14+27	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-3321	0+00	7+28	C	18’	12’	3’	1’	4”	2’	2’	R/W	R/W
J-3330	0+00	13+38	C	15’	12’	2’	1’	4”	BOD	EOS	R/W	R/W
J-3340	0+00	3+49	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-3350	0+00	12+43	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-3360	0+00	2+55	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-3370	0+00	5+66	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-4000	MP 0.0	MP 0.41	-	-	12’	-	-	4”	-	-	-	-
J-4000	0+00	16+24	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-4001	0+00	3+33	C	15’	12’	2’	1’	4”	2’	2’	R/W	R/W
J-6000	MP 0.0	MP 0.7	-	-	12’	-	-	4”	-	-	-	-
J-6100	MP 0.0	MP 1.65	-	-	12’	-	-	4”	-	-	-	-

R/W = right-of-way tags
EOS = grubbing limit equals edge of subgrade
BOD = grubbing limit equals back of ditch

ROCK LIST
BALLAST



Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout Length	Turnout Width	Turnout Taper
			K2	B2					L	H	T
					PIT RUN			**Commercial**			
* J-3310	0+00	10+61	1 ½ : 1	10”	52	10.61	552				
* J-3320	3+42	14+27	1 ½ : 1	10”	52	10.85	564				
* J-3330	0+00	13+38	1 ½ : 1	10”	52	13.38	696				
* J-3340	0+00	3+49	1 ½ : 1	10”	52	3.49	181				
* J-3350	0+00	12+43	1 ½ : 1	12”	63	12.43	783				
* J-3360	0+00	2+55	1 ½ : 1	10”	52	2.55	133				
* J-3370	0+00	5+66	1 ½ : 1	12”	63	5.66	357				
* J-4000	0+00	16+24	1 ½ : 1	10”	52	16.24	844				
* J-4001	0+00	3+33	1 ½ : 1	12”	63	3.33	210				
* landings					50	10	500				
					4 INCH MINUS			**Commercial**			
* J-3320	0+00	3+42	1 ½ : 1	12”	63	3.42	215				
* J-3321	0+00	7+28	1 ½ : 1	12”	63	7.28	459				
* J-4000	MP 0.2	MP 0.41	1 ½ : 1	12”	63	11.09	699				
					8 INCH PLUS			**Commercial**			
Pipe inlets and outlets							2				
* Pipe inlets and outlets							9				
					LIGHT LOOSE RIPRAP			**Commercial**			
Pipe inlets and outlets							140				
* Pipe inlets and outlets							20				

*Optional Rock

Optional PIT RUN TOTAL 4,820 Cubic Yards
Optional 4 INCH MINUS TOTAL 1373 Cubic Yards
Required 8 INCH PLUS TOTAL 2 Cubic Yards
Optional 8 INCH PLUS TOTAL 9 Cubic Yards
Required LIGHT LOOSE RIPRAP TOTAL 140 Cubic Yards
Optional LIGHT LOOSE RIPRAP TOTAL 20 Cubic Yards

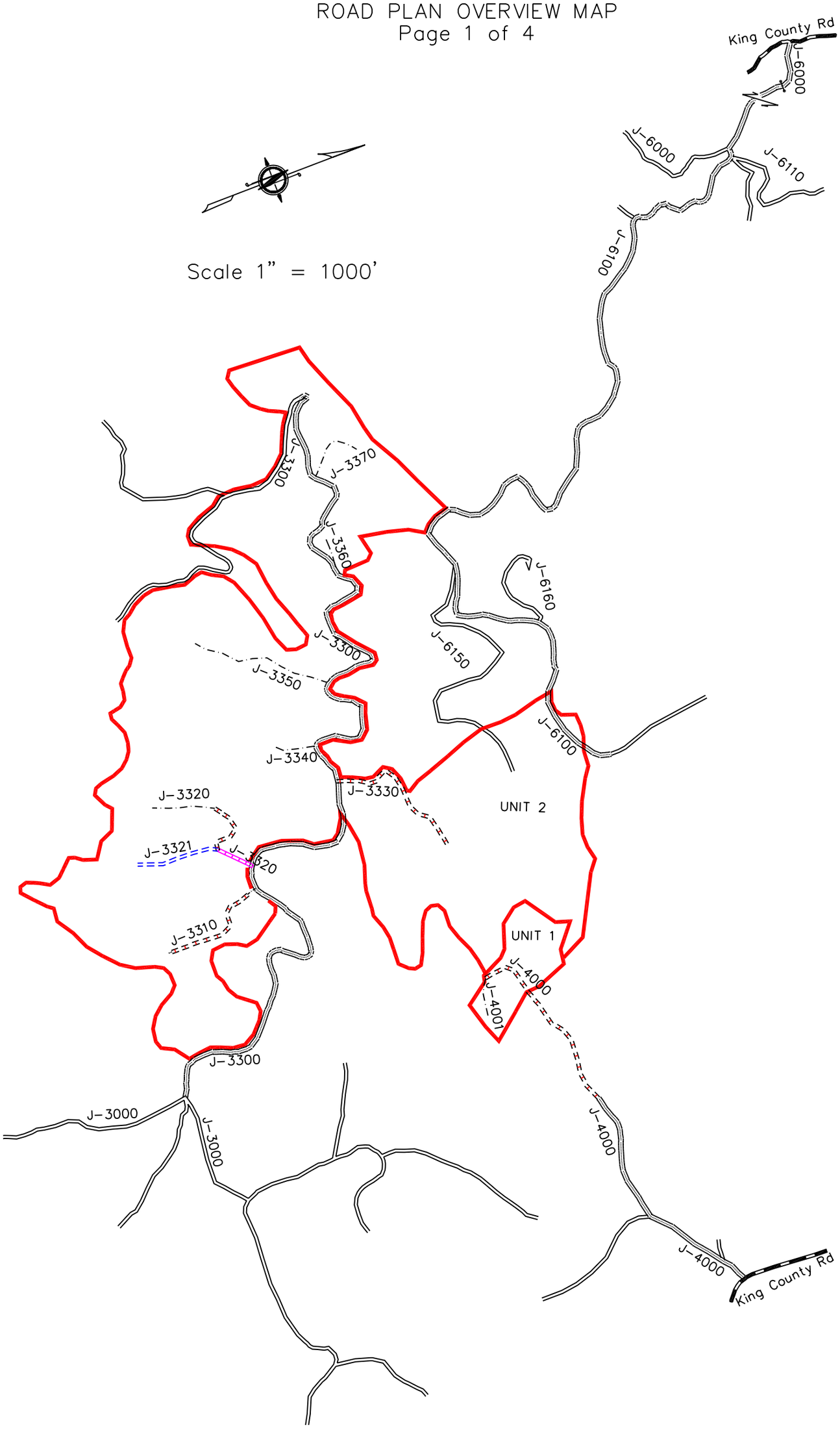
SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1				
					2 ½ INCH MINUS			Commercial
J-3300	Spot Patch						800	
J-4000 (MP0.0-MP0.2)	Spot Patch						100	
J-6100	Spot Patch						40	
Pipe backfills on J-3300							60	

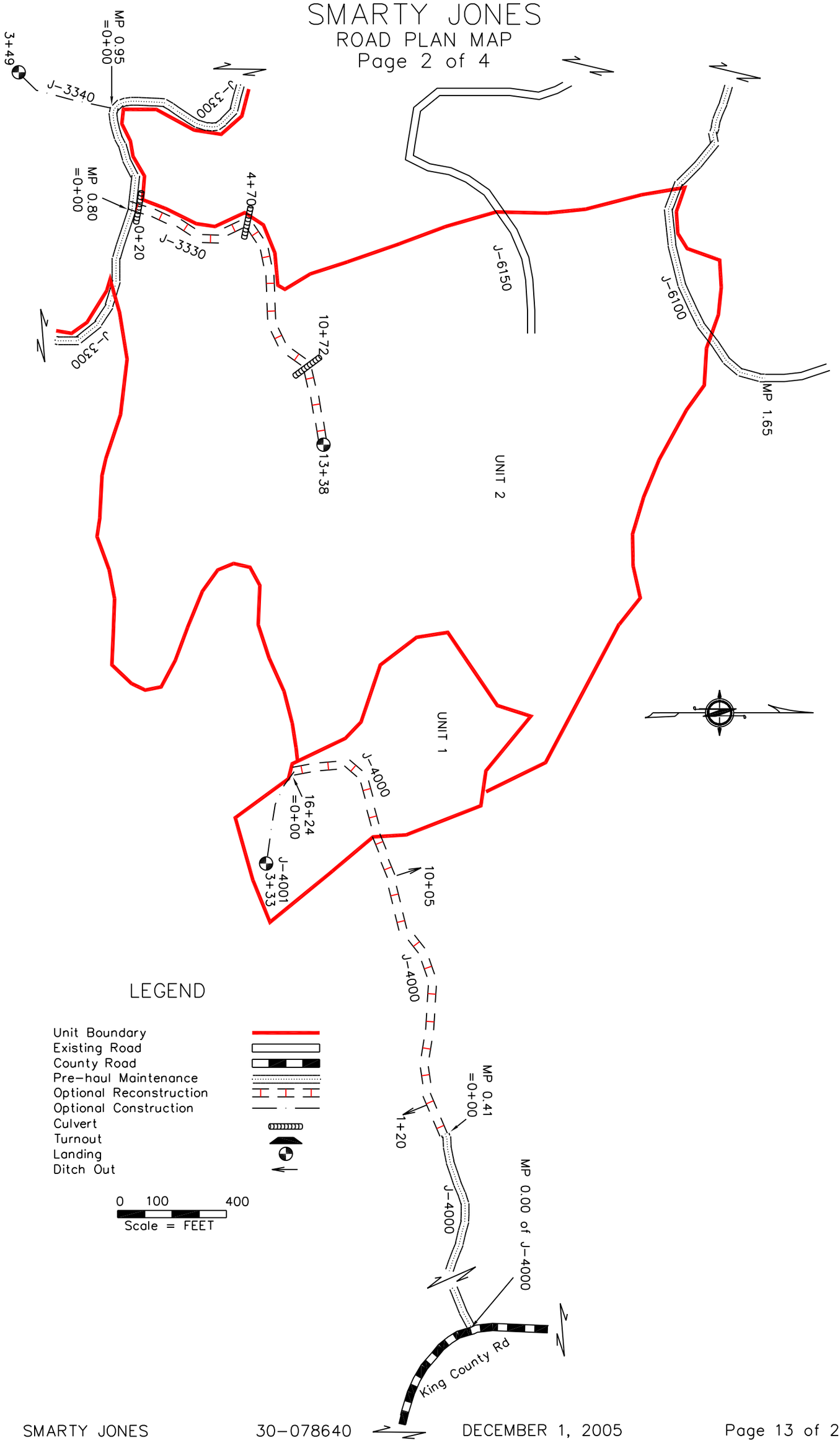
Required 2 ½ INCH MINUS TOTAL 1000 Cubic Yards

Rock quantities shown are minimums**.**

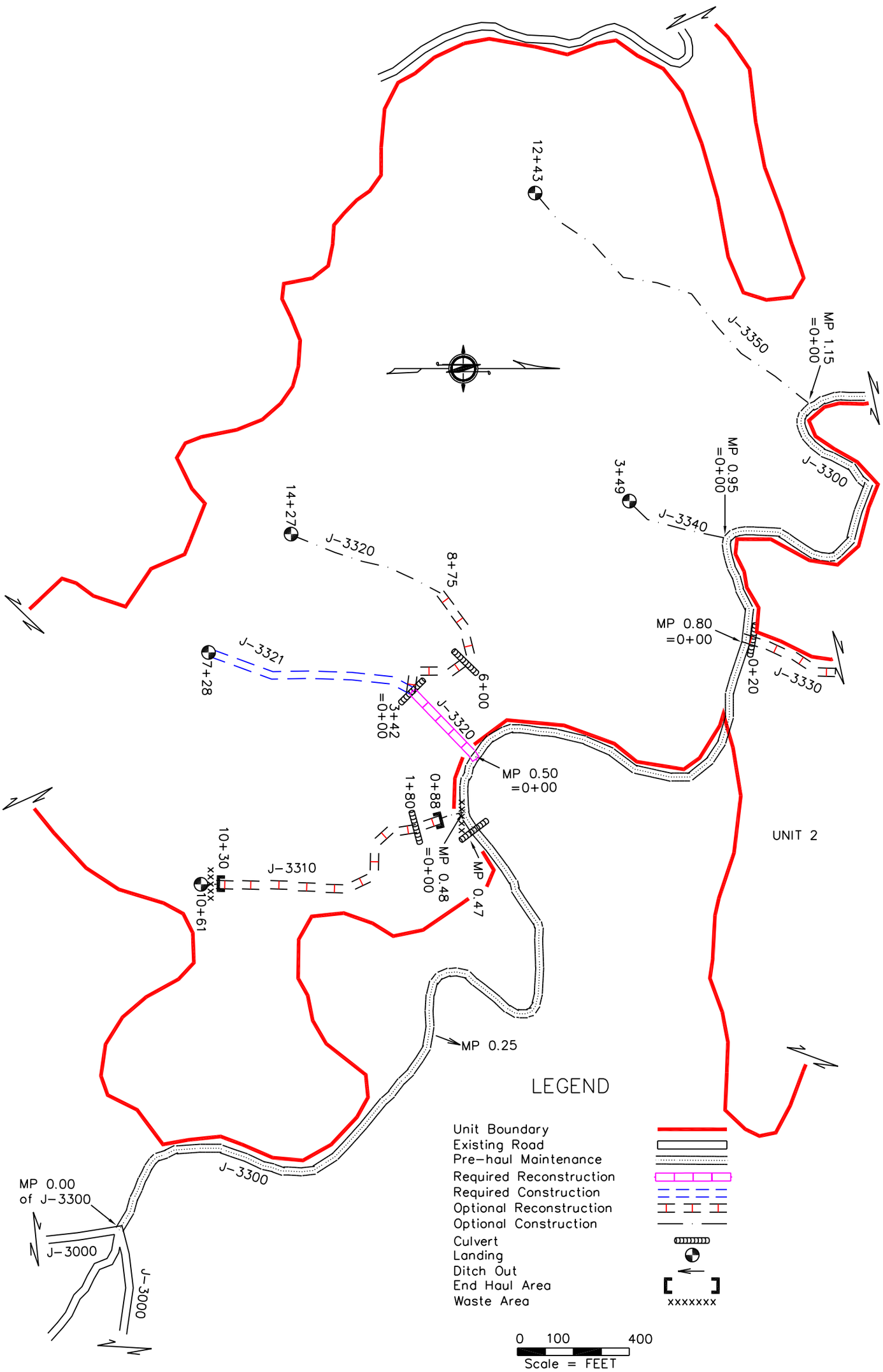
SMARTY JONES
ROAD PLAN OVERVIEW MAP
Page 1 of 4



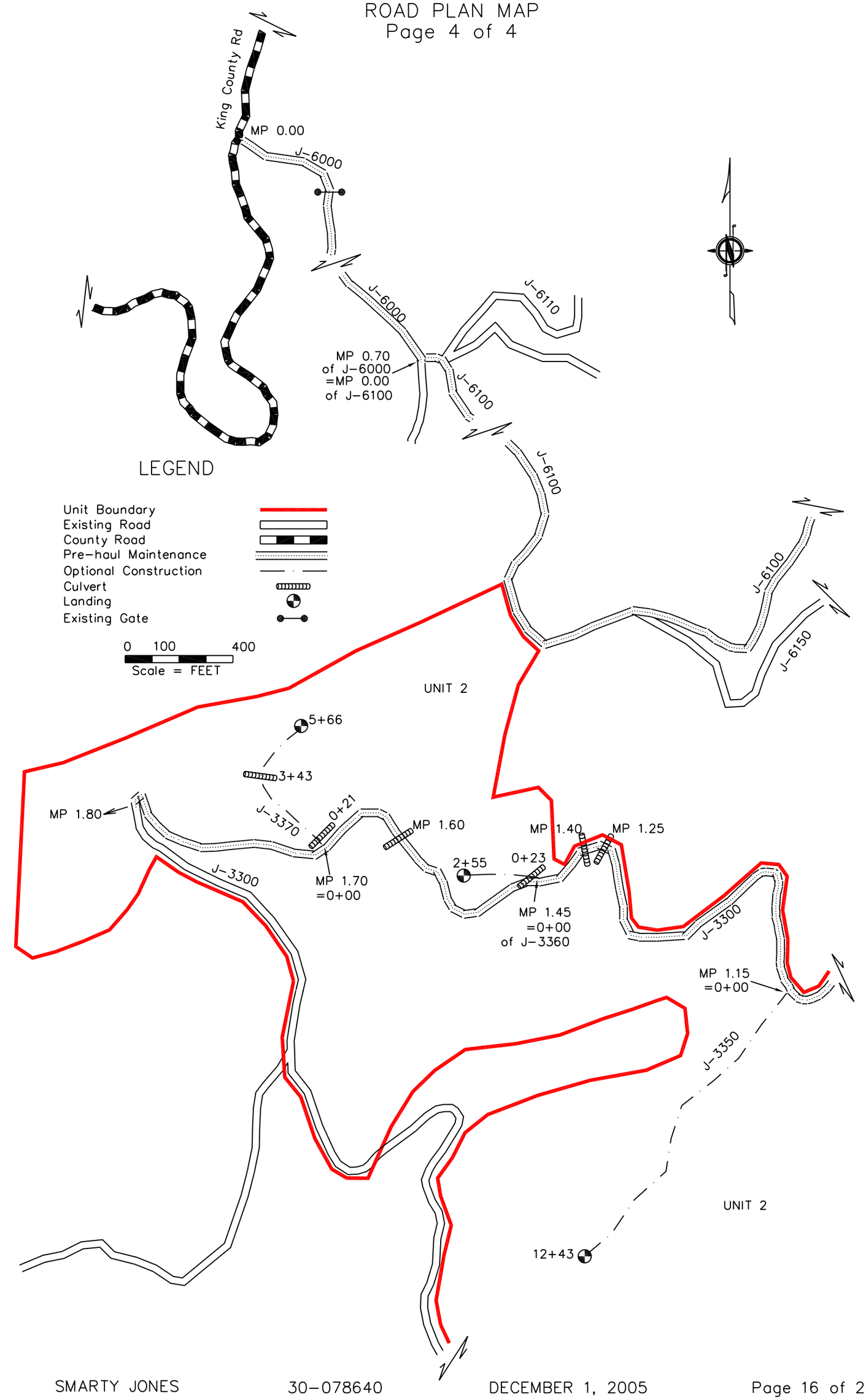
SMARTY JONES
ROAD PLAN MAP
Page 2 of 4



SMARTY JONES
ROAD PLAN MAP
Page 3 of 4



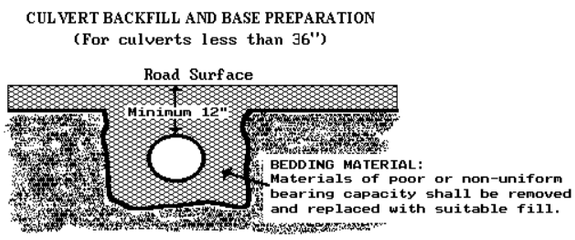
SMARTY JONES
ROAD PLAN MAP
Page 4 of 4



CULVERT LIST (SHEET 1 OF 2)

Road Number	Location	Culvert Dia.	Culvert Gauge If Steel	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material	Placement Method	Const. Staked	Remarks
J-3300	MP 0.25	-	-	-	-	-	-	-	-	-	-	-	Ditchout right
	MP 0.38	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.41	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.45	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.47	18”	-	34	-	-	1/2	1/2	8” +	CR	-	-	New installation
	MP 0.51	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.65	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.75	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.90	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 1.00	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet and re-attach flume
	MP 1.05	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 1.10	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 1.20	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 1.25	30”	-	56	-	-	10	80	LL	CR	-	-	Replace existing pipe, will require widening fill
	MP 1.40	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 1.50	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 1.6	18”	-	12	-	-	-	60	LL	CR	-	-	Add extension to existing pipe, will require widening fill
	MP 1.75	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 1.80	-	-	-	-	-	-	-	-	-	-	-	Ditchout right
J-3310	1+80	18”		28			1/2	1/2	8” +	NT			New installation
	-	18”	-	30	-	-	1/2	1/2	8” +	NT	-	-	Location to be determined after ditchline has been reconstructed
J-3320	3+42	18”	-	30	-	-	1/2	1/2	8” +	NT	-	-	New installation
	6+00	18”	-	30	-	-	1/2	1/2	8” +	NT	-	-	New installation
J-3330	0+20	18”	-	40	-	-	1/2	1/2	8” +	NT	-	-	New installation
	4+70	24”	-	48	-	-	5	5	LL	NT	-	-	See Note 1
	10+72	24”	-	32	-	-	5	5	LL	NT	-	-	See Note 1
	-	18”	-	30	-	-	1/2	1/2	8” +	NT	-	-	Location to be determined after ditchline has been reconstructed

Note 1: If these two pipes are installed and abandoned between July 1 and September 15 of the same year, they may be installed as shown on the attached LOG FILL DETAIL SHEET.

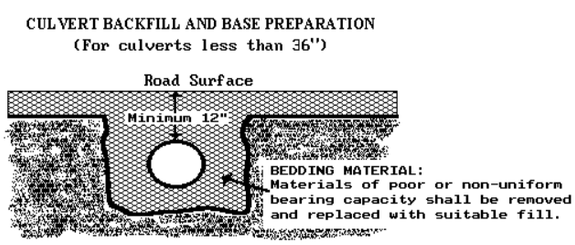


Key:

CR - 2 ½” minus crushed
8” + - 8 inch plus
SR - Shot Rock
PR - PIT RUN
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe

CULVERT LIST (SHEET 2 OF 2)

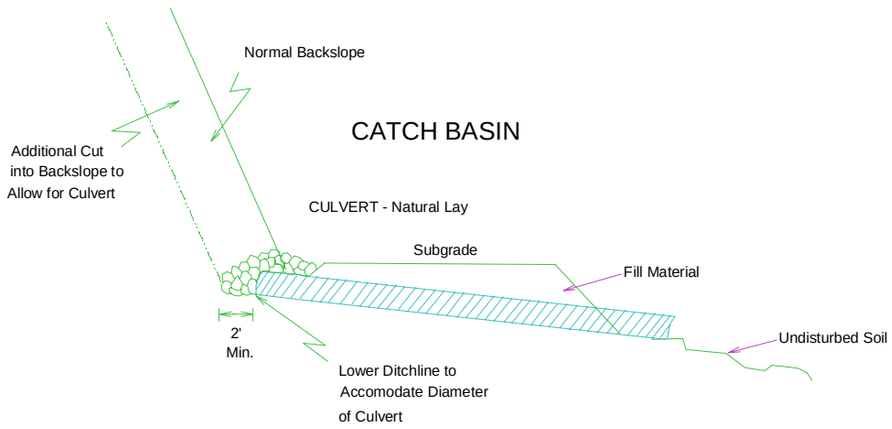
Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material	Placement Method	Const. Staked	Remarks
			If Steel										
J-3360	0+23	18”	-	40	-	-	1/2	1/2	8” +	NT	-	-	New installation
J-3370	0+21	18”	-	40	-	-	1/2	1/2	8” +	NT	-	-	New installation
	3+43	18”	-	40	-	-	1/2	1/2	8” +	NT	-	-	New installation
J-4000	MP 0.25	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.38	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	MP 0.41	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
	1+20	-	-	-	-	-	-	-	-	-	-	-	Ditchout left
	3+88	18”	-	30	-	-	1/2	1/2	8” +	NT	-	-	
	7+20	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet and flush pipe
	10+05	-	-	-	-	-	-	-	-	-	-	-	Ditchout right
	13+65	-	-	-	-	-	-	-	-	-	-	-	Clean inlet and outlet
J-6100	MP 0.15	-	-	-	-	-	-	-	-	-	-	-	Hand clean flume
	MP 0.85	-	-	-	-	-	-	-	-	-	-	-	Hand clean flume

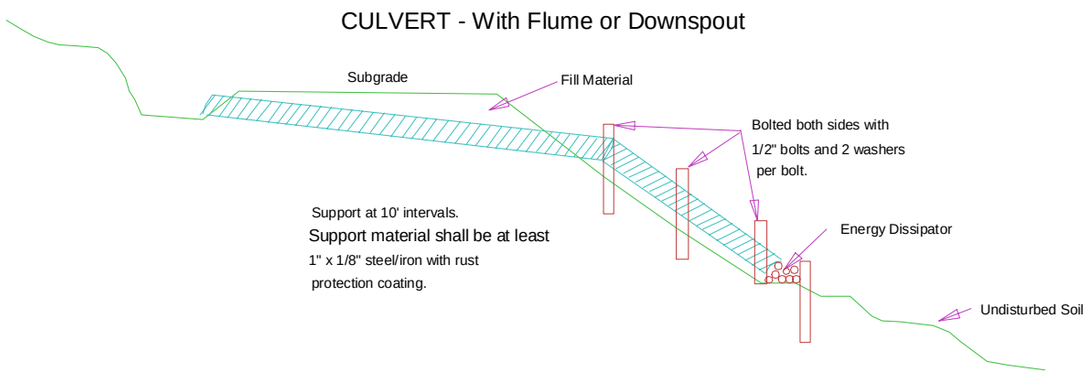


Key:

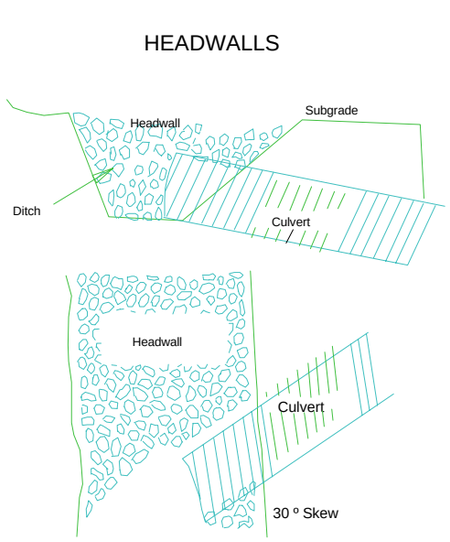
CR - 2 ½” minus crushed
8” + - 8 inch plus
SR - Shot Rock
PR - PIT RUN
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap

CULVERT AND DRAINAGE SPECIFICATION DETAIL

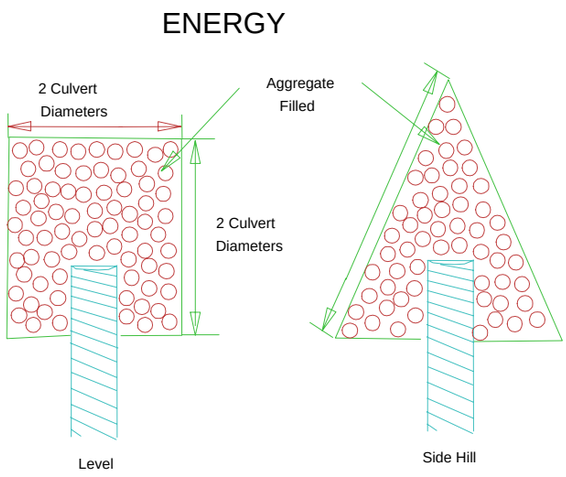




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

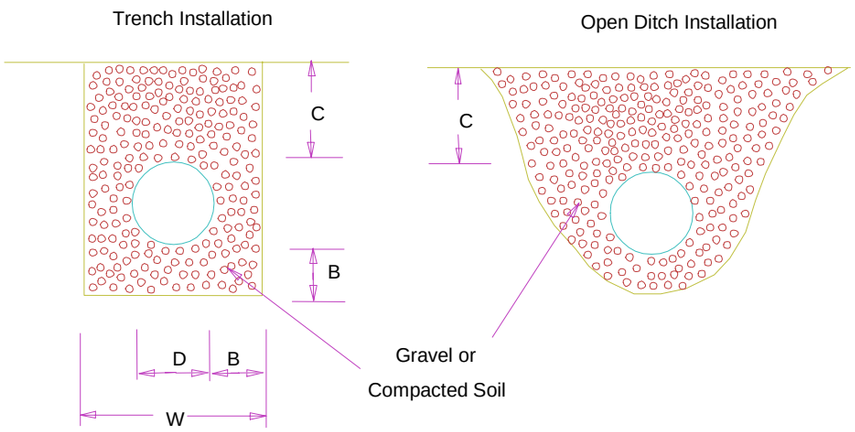
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% of that material is required. This minimum compaction can be achieved by either hand or mechanical tamping. Purchaser shall test the compaction level and bare all associated costs.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 12:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

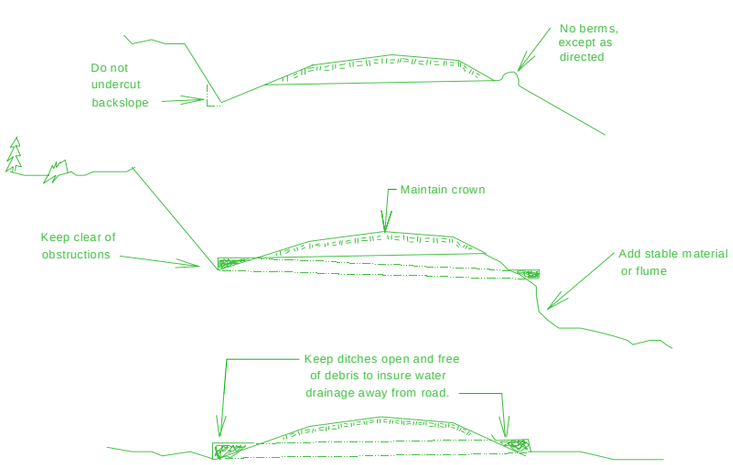
B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.



LIVE STREAM CULVERT REMOVAL PROCEDURE

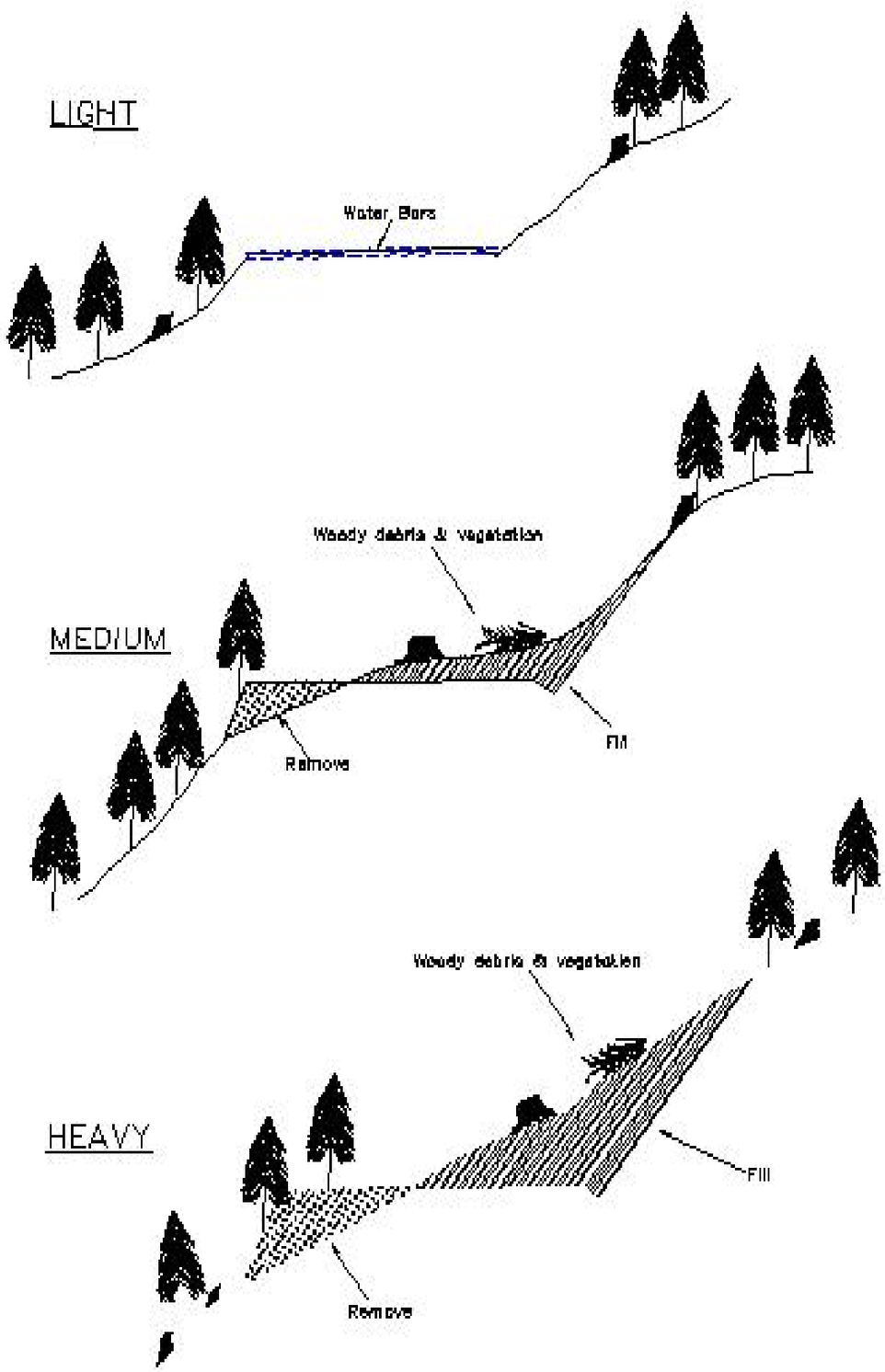
Order of work is as follows, deviations shall be approved, in writing, by the Contract Administrator.

1) Purchaser shall notify the State of intent to start project, and a pre-work conference shall be held before move in of equipment. State will designate a representative that will remain on site at all times when work is being performed in creek channel.
2) Assemble the items on the Materials List onsite before proceeding.
3) Remove 95% of fill (see FILL REMOVAL DETAIL) and end haul to a waste area approved by the Contract Administrator that is at least 100' from any live stream.
4) Set up pumps (3 required, with one as backup).
5) Dam up stream with sandbags and line floor of dam with plastic (to prevent sub-surface water flow), place clean rock on plastic to hold in place, and key leading edge of plastic into channel bottom - see SETTLING POND AND PUMP DETAIL. Build a settling pond at culvert outlet. Fill may need to be removed before the settling pond installation due to space limitations. Pump clean water at catch basin around work site and back into stream. Dirty water shall be pumped away from site and onto forest floor a minimum of 200 feet from live streams. Silt fence shall be erected at base of fill slope and bottom edge of fence shall be keyed into slope and held in place with rocks to prevent water from flowing under the silt fence.
6) Remove remainder of fill and culvert.
7) Backfill settling pond.
8) Cover exposed soils within 100 feet of all live streams with straw (minimum depth of 8 inches) and grass seed.

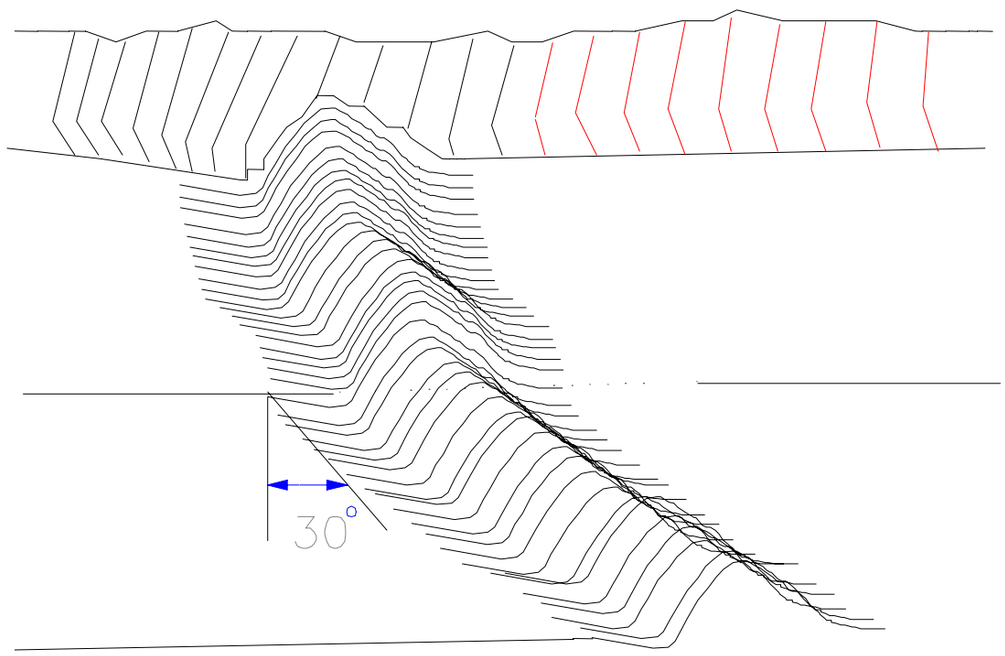
Materials List:

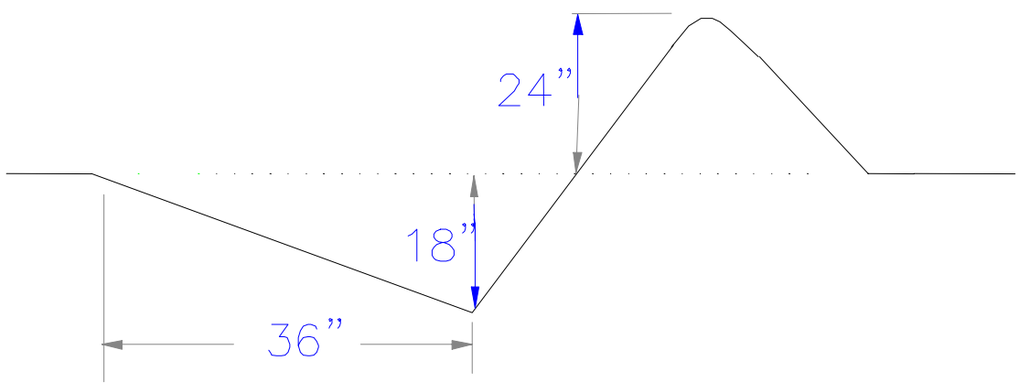
- 3 pumps, (one as a backup). The clean water pump (dam at culvert catch basin) shall have a minimum capacity of 1200 gallons per minute. The dirty water pump (settling pond) and the backup pump shall each have a minimum capacity of 600 gpm. Culvert removal should not start during rain or threat of rain;
- plastic sheet;
- silt fence and stakes;
- bales of straw;
- riprap.

ROAD ABANDONMENT CROSS SECTIONS

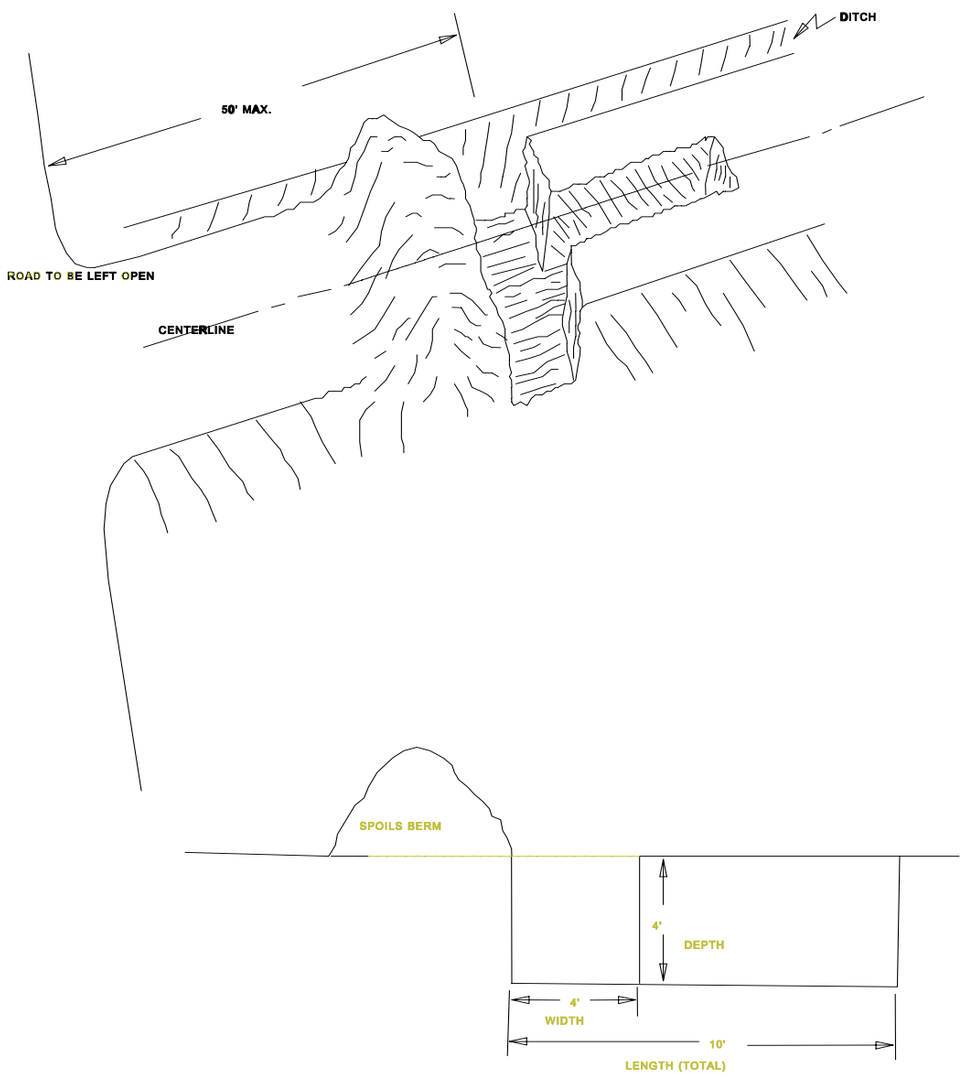


NON-DRIVABLE WATER BAR DETAIL

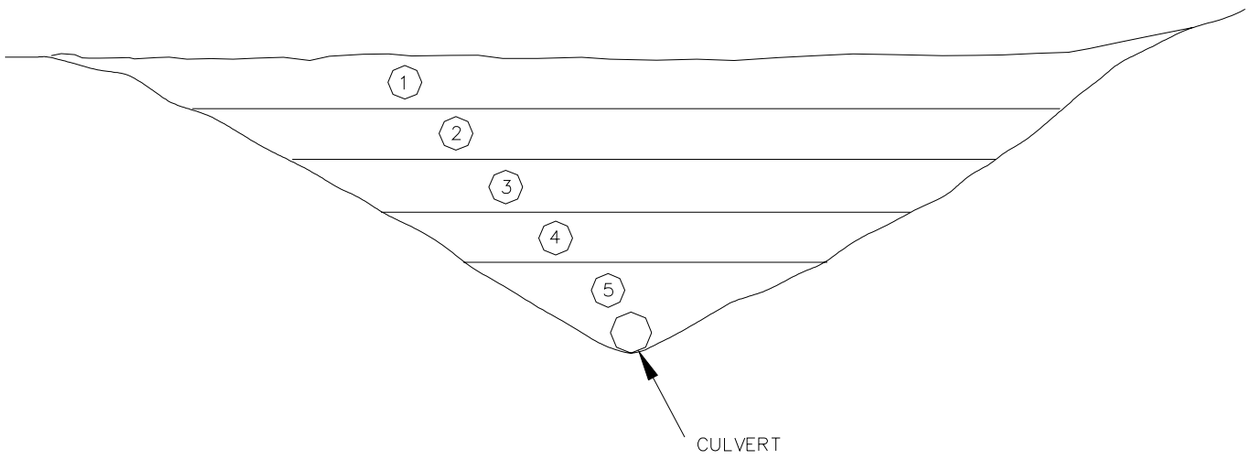




"T" TANK TRAP DETAIL

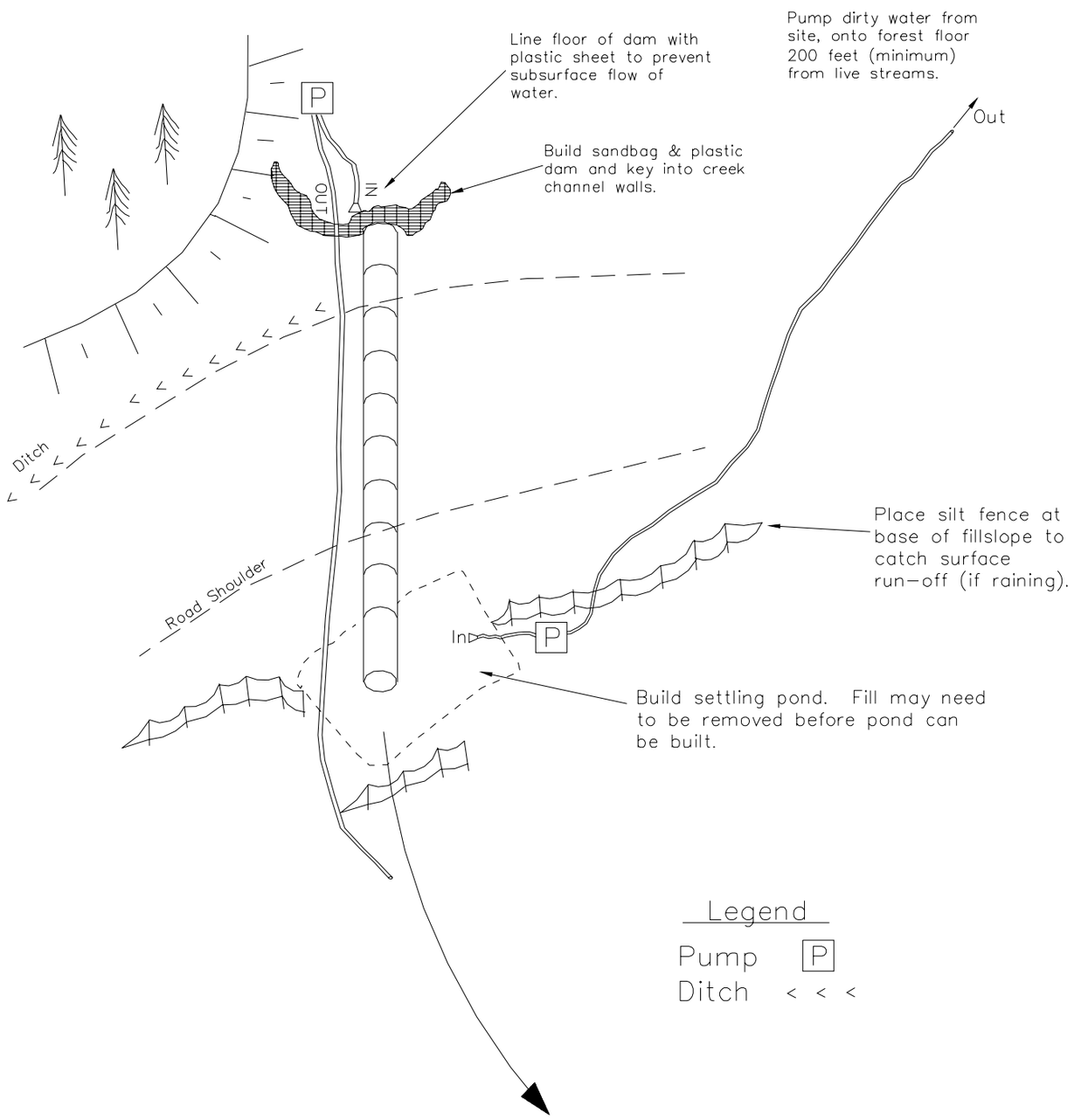


FILL REMOVAL DETAIL

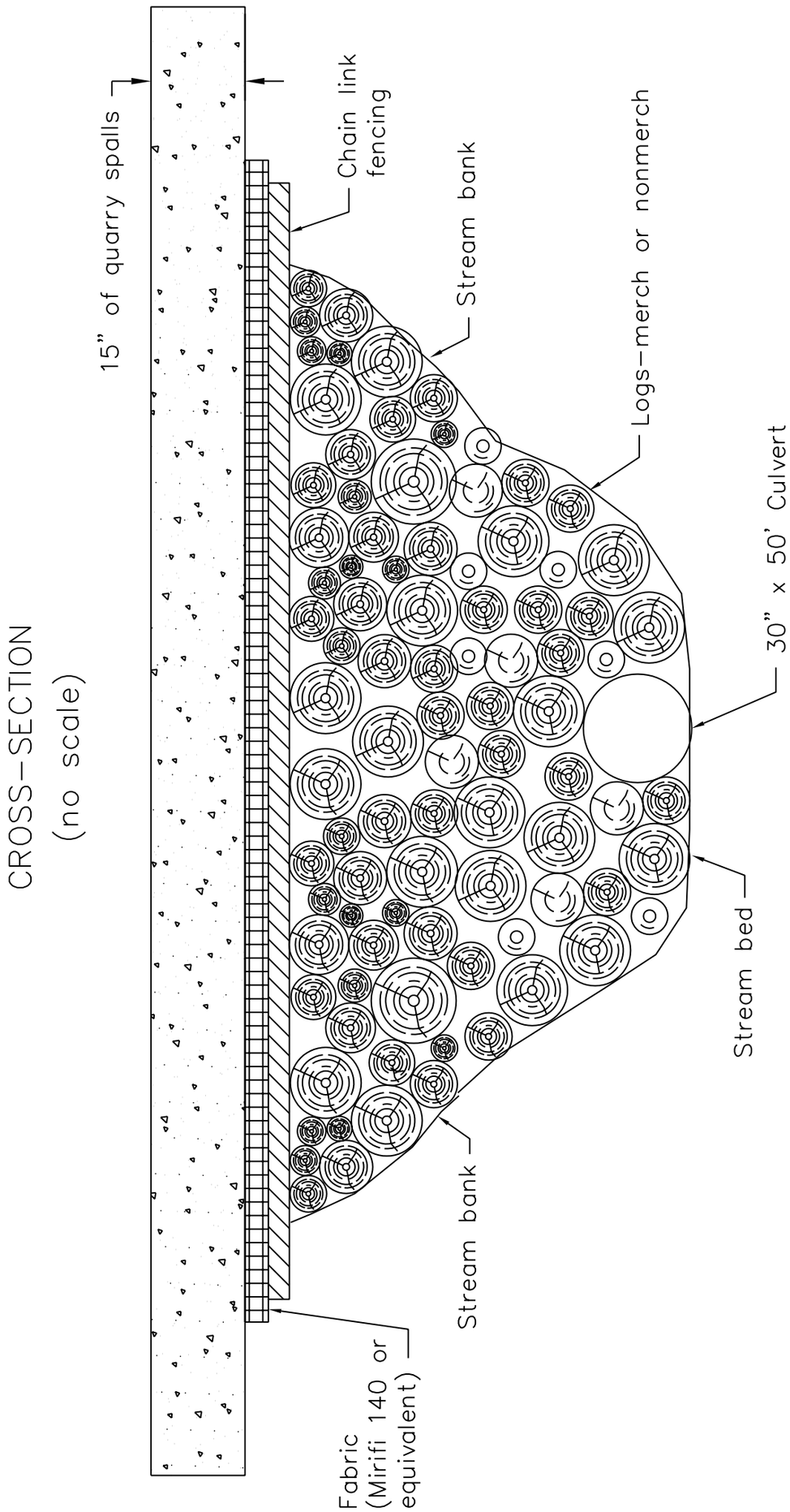


- Remove fill in layers not to exceed 3 feet.
- Channel slopes shall be according to Section 6 – DRAINAGE and the Live Stream Culvert Removal Procedure

SETTLING POND AND PUMP DETAIL



LOG FILL DETAIL SHEET



DEPARTMENT OF NATURAL RESOURCES - PACIFIC CASCADE REGION

FORM 9-87(Rev. 05-03)

SUMMARY - Road Development Costs

DISTRICT: Lewis

SALE/PROJECT NAME: Smarty Jones Thinning and CC Timber CONTRACT NUMBER: 30-078640

LEGAL DESCRIPTION: Sec. 23&24, T12N, R3W, WM

ROAD NUMBER:	3320,J3321,J3330,J3340,J3350,J3360,J337	J3310,J3320,J3330,J4000	J3300,J4000,J6000,J6100
ROAD STANDARD:	Construction	Reconstruction	Pre-haul maintenance
NUMBER OF STATIONS:	41.45	47.79	240.77
SIDESLOPE:	0-70%	N/A	N/A
CLEARING AND GRUBBING:	$4,775	$4,800	
EXCAVATION AND FILL:	$6,879	$7,625	
MISC. MAINTENANCE:			$4,875
ROCK TOTALS (Cu. Yds.):	$46,779	$35,916	$31,225
CULVERTS AND FLUMES:	$1,230	$4,076	$1,756
STRUCTURES:	$0	$0	$0
GENERAL EXPENSES:	$5,370	$4,718	$3,407
MOBILIZATION:	$1,160	$1,160	$1,160
TOTAL COSTS:	$66,193	$58,295	$42,423
COST PER STATION:	$1,597	$1,220	$176

ROAD DEACTIVATION AND ABANDONMENT COSTS: $4,932

NOTE: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $171,843

SALE VOLUME MBF = 1,500

TOTAL COST PER MBF = $114.56

APPROXIMATE TOTAL COST PER MBF IF OPTIONAL ROCK IS NOT APPLIED = $46.03

Plans to be furnished by: Compiled by: Randall Kirk Date: 12/01/05

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - CONSTRUCTION

SALE NAME: Smarty Jones Thinning and CC Timber Sale CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
	10	40	1.00	2.88	$40	1.00	32.24	$3,714
	25	40	1.00	2.88	$40	1.00	9.21	$1,061

Clear and Grub TOTAL = $4,775

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
	10	1.00	1.50	$88	1.00	32.24	$4,256
	25	1.00	2.25	$88	1.00	9.21	$1,824

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				$0
Large Fills/ Cuts		0.5	$1,600	$800

Excavation TOTAL = $6,879

III. BALLAST AND SURFACING :

Pit Run source: commercial
4" minus source commercial
8" plus source : commercial

Description	cu.yds/sta x stations =	cubic yards
Pit Run		2,668
4" minus		459
8" plus		3

UNIT COSTS	Pit Run	4" minus	8" plus
Drill & Shoot			
Dig and load			
Crushing			
Purchase	$7.00	$8.25	$19.20
Haul *	$6.50	$6.50	$6.50
Spread	$0.80	$0.80	$1.50
Compact	$0.45	$0.45	
Strip			
Reclamation			
TOTAL ($/cy)	$14.75	$16.00	$27.20

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	18.0						
Ave. Speed =	30	Pit Run	2668	Cu. yds @	$14.75	/cu. yd =	$39,353
Delay (Hrs.)=	0.2	4" minus	459	Cu. yds @	$16.00	/cu. yd =	$7,344
Cost / Hour =	$65.00	8" plus	3	Cu. yds @	$27.20	/cu. yd =	$82
CY / Load =	8						

Rock total = $46,779

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
			18"	120	$10.00	$1,200
Bands & Gaskets			18"	3	$10.00	$30

Culvert total = $1,230

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $59,663

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $5,370

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	9	$900
Grader	400	3	$1,200
Compactor	400		$0
Excavator	450	2	$900
Dozer D8)	400		$0
Front end loader	400		$0
Rock crusher	$1,500		$0
Dozer (D5)	$240	2	$480

Total Mobilization = $3,480 Mobilization sub-total = $1,160

Road No. J3310,J3320,J3321,J3330,J3340,J3350,J3360,J3370,J4001
Standard: Construction
Stations: 41.45

SHEET TOTAL = $66,193

PACIFIC CASCADE REGION REGION - ROAD COST ESTIMATE - RECONSTRUCTION

SALE NAME: Smarty Jones Thinning and CC Timber Sale CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

4 days with a Cat 325 @ $1200/day = $4800

Clear and Grub TOTAL = $4,800

II. EXCAVATION:

	Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
J3310,J3320,J3330,J4000								

3 days with a Cat 325 @ $1200/day = $3600
1/2 day with a roller @ $650/day = $325

*End Haul, Over Haul, Large Fills/Cuts

2 days with a Cat 325 @ $1200/day = $2400
2 days with a truck @ $650/day = $1300

Excavation TOTAL = $7,625

III. BALLAST AND SURFACING :

Pit Run source:	commercial
4" minus source	commercial
8" plus source :	commercial
rip rap source:	commercial

Description	cu.yds/sta x stations =	cubic yards
Pit Run		2,152
4" minus		215
8" plus		7
LL Rip Rap		20

UNIT COSTS	Pit Run	4" minus	8" plus
Drill & Shoot			
Dig and load			
Crushing			
Purchase	$7.00	$8.25	$19.20
Haul *	$6.50	$6.50	$6.50
Spread	$0.80	$0.80	$1.50
Compact	$0.45	$0.45	
Strip			
Reclamation			
TOTAL ($/cy)	$14.75	$16.00	$27.20

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	18.0						
Ave. Speed =	30	Pit Run	2152	Cu. yds @	$14.75	/cu. yd =	$31,742
Delay (Hrs.)=	0.2	4" minus	215	Cu. yds @	$16.00	/cu. yd =	$3,440
Cost / Hour =	$65.00	8" plus	7	Cu. yds @	$27.20	/cu. yd =	$190
CY / Load =	8	LL Rip Rap	20	Cu. yds @	$27.20	/cu. yd =	$544

Rock total = $35,916

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
			18	218	$10.00	$2,180
			30	80	$22.00	$1,760
Bands & Gaskets						
			18	7	$10.00	$70
			30	3	$22.00	$66

Culvert total = $4,076

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $52,417

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $4,718

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	$100	9	$900
Grader	$400	3	$1,200
Compactor	$400	0	$0
Excavator	$450	2	$900
Dozer D8)	$400	0	$0
Front end loader	$400	0	$0
Rock crusher	$1,500	0	$0
Dozer (D5)	$240	2	$480

Total Mobilization = $3,480 Mobilization sub-total = $1,160

Road No. J3310,J3320,J3330,J4000
Standard: Reconstruction
Stations: 47.79

SHEET TOTAL = $58,295

By: Randall Kirk Sheet 3 of 5 Date: 12/01/05

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - PRE-HAUL MAINTENANCE

SALE NAME: Smarty Jones Thinning and CC Timber Sale CONTRACT NUMBER: N/A

Total stations Pre-Haul Maintenance = 241

I. MISC. MAINTENANCE ITEMS:

J-6000 & J-6100
1 day with grader @ $750 day = $750
J-4000
1/2 day with CAT 325 @ $1200 day = $600
1/2 day with grader @ $750 day = $375
J-3300
2 days with CAT 325 @ $1200 day = $2400
1 day with grader @ $750 day = $750

Misc TOTAL = $4,875

III. BALLAST AND SURFACING :

Pit Run source: commercial
4" minus source commercial
2 1/2" minus source: commercial
8" plus source : commercial
rip rap source: commercial

Description	cu.yds/sta x stations =	cubic yards
Pit Run		0
4" minus		699
2 1/2" minus		1,000
8" plus		1
LL rip rap		120

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

UNIT COSTS	Pit Run	4" minus	2 1/2" minus
Drill & Shoot			
Dig and load			
Crushing			
Purchase	$7.00	$8.25	$9.00
Haul *	$6.50	$6.50	$6.50
Spread	$0.80	$0.80	$0.80
Compact	$0.45	$0.45	$0.45
Strip			
Reclamation			
TOTAL ($/cy)	$14.75	$16.00	$16.75

R.T. Miles =	18.0						
Ave. Speed =	30	Pit Run	0	Cu. yds @	$14.75	/cu. yd =	$0
Delay (Hrs.)=	0.2	4" minus	699	Cu. yds @	$16.00	/cu. yd =	$11,184
Cost / Hour =	$65.00	2 1/2" minus	1000	Cu. yds @	$16.75	/cu. yd =	$16,750
CY / Load =	8	8" plus	1	Cu. yds @	$27.20	/cu. yd =	$27
		LL rip rap	120	Cu. yds @	$27.20	/cu. yd =	$3,264

Rock total = $31,225

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
			18"	46	$10.00	$460
			30"	56	$22.00	$1,232
Bands & Gaskets						
			18"	2	$10.00	$20
			30"	2	$22.00	$44

Culvert total = $1,756

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $37,856

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $3,407

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	9	$900
Grader	400	3	$1,200
Compactor	400	0	$0
Excavator	450	2	$900
Dozer D8)	400	0	$0
Front end loader	400	0	$0
Rock crusher	$1,500	0	$0
Dozer (D5)	$240	2	$480

Total Mobilization = $3,480 Mobilization sub-total = $1,160

Road No. J3300,J4000,J6000,J6100
Standard: Pre-haul maintenance
Stations: 240.77

SHEET TOTAL = $42,423

By: Randall Kirk Sheet 4 of 5 Date: 12/01/05

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - PRE-HAUL MAINTENANCE

SALE NAME: Smarty Jones Thinning and CC Timber Sale CONTRACT NUMBER: N/A

Total stations Road Closure = 78.54

I. MISC. ROAD CLOSURE COSTS:

3 days with a CAT 325 @ $1200/day = $3600

Misc TOTAL = $3,600

VI. GENERAL EXPENSES: Overhead & General Exp. Add 12% $432

VII. MOBILIZATION:

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100		$0
Grader	400		$0
Compactor	400		$0
Excavator	450	2	$900
Dozer D8)	400		$0
Front end loader	400		$0
Rock crusher	$1,500		$0
Dozer (D5)	$240		$0

* These move in costs are separate since they will occur after logging is done

Total Mobilization = $900

Road No. All optional reconstruction and construction
Standard: Road Closure
Stations: 78.54

SHEET TOTAL = $4,932

By: Randall Kirk Date: 12/01/05